Office of Energy Efficiency and Renewable Energy

Advanced Proton-Exchange-Membrane Fuel-Cell Stack

Background

Energy Partners has worked with proton-exchange-membrane (PEM) fuel cells and fuel-cell systems since 1990. Supported by the U.S. Department of Energy (DOE), Energy Partners has developed a new generation of advanced PEM fuel-cell stacks that can be used in automobiles as well as in stationary power plants.

Accomplishments

- Almost 1/3rd the weight and volume over previous models.
- 20-kilowatt electrical output in a single stack.
- Very high power density with low platinum loading.
- Low fuel and air requirements, which means low parasitic load and high system efficiency.
- Virginia Tech and Texas Tech, participants in DOE's FutureCar Challenge, are incorporating Energy Partners fuel-cell stacks into their competition vehicles.

Virginia Tech's FutureCar

Energy Partners NG2000 PEM Fuel-Cell Stack

Benefits

- Fits easily under the hood of a passenger car.
- Runs on a clean fuel (hydrogen) and generates no harmful emissions.
- Efficiently converts fuel into direct current electricity.

Future Activities

- Reduce weight further for automotive applications, by improving performance, carefully designing major components, and using lightweight materials.
- Increase power output either by making larger fuel-cell stacks or by combining smaller stacks.
- Adapt fuel cell to use a more conventional fuel than hydrogen.

Partners in Success

Energy Partners
Florida Atlantic University
Texas A&M University
PSI Technologies
Southwest Research Institute

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